Ravi Maths Tuition Centre

Time : 200 Mins **BASIC CONCEPTS OF CHEMISTRY 1** **Marks : 542**

1. What volume of 5 M Na_2SO_4 must be added to 25 mL of 1 M $BaCl_2$ to produce 10 g of $BaSO_4$?
   a) 8.57 mL b) 7.2 mL c) 10 mL d) 12 mL
2. The empirical formula of a compound is CH_2O_2 What could be its molecular formula?
   a) $C_2H_2O_2$ b) $C_2H_2O_4$ c) $C_2H_4O_4$ d) CH_4O_4
3. The number of moles of $KMnO_4$ that will be needed to react with one mole of sulphite ion in acidic solution is :
   a) 4/5 b) 2/5 c) 1 d) 3/5
4. The number of moles of oxygen in 1 L of air containing 21%oxygen by volume, under standard conditions, is :
   a) 0.0093 mole b) 2.10 moles c) 0.186 mole d) 0.21 mole
5. What quantity of copper oxide will react with 2.80 L of hydrogen at NTP?
   a) 79.5 g b) 2 g c) 9.9 g d) 22.4 g
6. What should be the volume of the milk (in m^3)which measures 5 L?
   a) 5×10^{-3} m^3 b) 5×10^3 m^3 c) $5 \times 10000 m^3$ d) 5×10^6 m^3
7. How many significant figures are present in 0.010100×10^{-3}?
   a) 7 b) 5 c) 3 d) 10
8. One litre hard water contains 12.00 mg Mg^{2+} Milliequuivalents of washing soda required to remove its hardness is
   a) 1 b) 12.16 c) 1×10^{-3} d) 12.16×10^{-3}
9. Boron has two stable isotopes, ^{10}B (19%) and ^{11}B (81%). Average atomic weight for boron in the periodic table is:
   a) 10.8 b) 10.2 c) 11.2 d) 10.0

10. The statements for laws of chemical combinations are given below. Mark the option which is not correctly matched.
    a) Matter can neither be created nor destroyed: Law of conservation of mass
    b)
    A compound always contains exactly the same proportion of elements by weight: Law of definite proportions
    c) When gases combine they do so in a simple ratio by weight: Gay Lussac's Law
    d)
    Equal volumes of gases at same temperature and pressure contain same number of molecules: Avogadro's Law
11. A solution is prepared by adding 5 g of a solute 'X' to 45 g of solvent 'Y. What is the mass per cent of the solute 'X'?
    a) 10% b) 11.1% c) 90% d) 75%
12. HCI is produced in the stomach which can be neutralised by $Mg(OH)_2$ in the form of milk of , magnesia. How much $Mg(OH)_2$ is required to : neutralise one mole of stomach acid?
    a) 29.16 g b) 34.3 g c) 58.33 g d) 68.66 g
13. The number of gram molecules of oxygen in 6.02×10^{24} CO molecules is :
    a) 10 g molecules b) 5 g molecules c) 1 g molecule d) 0.5 g molecules
14. An organic compound contains carbon, hydrogen and oxygen. Its elemental analysis gave C 38.71% and H9.67%. The empirical formula of the compound would be:
    a) CH_3O b) CH_2O c) CHO d) CH_4O
15. The number of oxygen atoms in 4.4 g of CO_2 is :
    a) 1.2×10^{23} atoms b) 6×10^{23} atoms c) 6×10^{23} atoms
    d) 12×10^{23} atoms
16. Specific volume of cylindrical virus particle is 6.02×10^{-2} cc/gm. Whose radius and length 6 A respectively. If $N_A = 6.02 \times 10^{23}$, find molecular weight of virus
    a) 3.08×10^3 kg/mol b) 3.08×10^4 kg/mol c) 1.54×10^4 kg/mol
    d) 15.4 Kg/mol
17. Two students performed the same experiment separately and each one of them recorded two readings of mass which are given below. Correct reading of mass is 3.0 g. On the basis of given data, mark the correct option out of the following

statements.

Student	Readings	
	(i)	(ii)
A	3.01	2.99
B	3.05	2.95

a) Results of both the students are neither accurate nor precise.
b) Results of student A are both precise and accurate.
c) Results of student B are neither precise nor accurate.
d) Results of student B are both precise and accurate.

18. 4.28 g of NaOH is dissolved in water and the solution is made to 250 cc. What will be the molarity of the solution?
    a) 0.615 mol L^{-1} b) 0.428 mol L^{-1} c) 0.301 mol L^{-1} d) 0.99 mol L^{-1}
19. A compound contains two elements 'X' and 'Y' in the ratio of 50% each. Atomic mass of 'X' is 20 and 'Y' is 40. What can be its simplest formula?
    a) XY b) X_2Y c) XY_2 d) X_2Y_3
20. What mass of hydrochloric acid is needed to decompose 50 g of limestone?
    a) 36.5g b) 73 g c) 50 g d) 100 g
21. 2.82 g of glucose is dissolved in 30 g of water. The mole fraction of glucose in the solution is
    a) 0.01 b) 0.99 c) 0.52 d) 1.66
22. The following data are obtained when dinitrogen and dioxygen react together to form different compounds:

Mass of dinitrogen	Mass of dioxygen
14 g	16 g
14 g	32 g
28 g	32 g
28 g	96 g

    Which law of chemical combination is obeyed by the above experimental data?
    a) Law of conservation of mass b) Law of definite proportions
    c) Law of multiple proportions d) Avogadro's Law
23. **Assertion:** Temperature below 0°C is possible in Celsius scale but on Kelvin scale, negative temperature is not possible.
    Reason: The Kelvin scale is related to Celsius scale as K = 0°C + 273

a)
Both assertion and reason are correct and reason is correct explanation for assertion.
b)
Both assertion and reason are correct but reason is not correct explanation for assertion.
c) Assertion is correct but reason is incorrect.
d) Assertion is incorrect but reason is correct.

24. The number of oxygen atoms present in 1 mole of oxalic acid dihydrate is :
a) 6×10^{23} b) $6..022 \times 10^{34}$ c) 7.22×10^{23} d) 36.13×10^{23}

25. The result of the operation 2.5 x 1.25 should be which of the following on the basis of significant figures?
a) 3.125 b) 3.13 c) 3.1 d) 31.25

26. 0.24 g of a volatile gas. upon vapourisation. gives 45 mL, vapour at NTP. What will be the vapour density of the substance? (Density of H_2 = 0.089)
a) 95.93 b) 59.93 c) 95.39 d) 5.993

27. Which of the following pairs illustrates the law of multiple proportions?
a) PH_3,HCl b) PbO, PbO_2 c) H_2S,SO_2 d) $CuCl_2$,$CuSO_4$

28. The number of atoms present in one mole of an element is equal to Avogadro number. Which of the following element contains the greatest number of atoms?
a) 4 g He b) 46 g Na c) 0.40 g Ca d) 12 g He

29. Percentage of Se in peroxidase anhydrase enzyme is 0.5% by weight (at. weigh = 78.4), then minimum molecular weight of peroxidase anhydrase enzyme is :
a) 1.568×10^3 b) 15.68 c) 2.168×10^3 d) 1.568×10^4

30. The molecular weight of O_2 and SO_2 are 32 and 64 respectively. At 15°C and 150 mm Hg pressure, l L of O_2 contains 'N' molecules. The nunber of molecules in 2 L of SO_2 , under the same conditions of temperature and pressure will he
a) N/2 b) N c) 2N d) 4N

31. A mixture having 2 g of hydrogen and 32 g of oxygen occupies how much volume at NTP?
a) 44.8 L b) 22.4 L c) 11.2 L d) 67.2 L

32. For everyone ^{37}Cl isotope there are three ^{35}Cl isotopes in a sample of chlorine. What will be the average atomic mass of chlorine?

a) 35 b) 37 c) 35.5 d) 35.6

33. The empirical formula and molecular mass of a compound are CH_2O and 180 g respectively. What will be the molecular formula of the compound?
    a) $C_9H_{18}O_9$ b) CH_2O c) $C_6H_{12}O_6$ d) $C_2H_4O_2$
34. A mixture of 2.3 g formic acid and 4.5 g oxalic acid is treated with cone. H_2SO_4, The evolved gaseous mixture is passed through KOH pellets. Weight (in g) of the remaining product at STP will be :
    a) 1.4 b) 3.0 c) 2.8 d) 4.4
35. What is the concentration of copper sulphate (in mol L^{-1}) if 80 g of it is dissolved in enough water to make a final volume of 3L?
    a) 0.0167 b) 0.167 c) 1.067 d) 10.67
36. A compound of magnesium contains 21.9% magnesium, 27.8% phosphorus and 50.3% oxygen. What will be the Simplest formula of the compound?
    a) $Mg_2P_2O_7$ b) $MgPO_3$ c) $Mg_2P_2O_2$ d) MgP_2O_4
37. How many grams of CaO are required to react with 852 g of P_4O_{10}?
    a) 852 g b) 1008 g c) 85 g d) 7095 g
38. **Assertion:** In laboratory, a solution of a desired concentration is prepared by diluting a stock solution.
    Reason : Stock solution is the solution of higher concentration.
    a)
    If both assertion and reason are true and reason is the correct explanation of assertion.
    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false.
    d) If both assertion and reason are false.
39. The maximum number of molecules is present in:
    a) 15 L of H_2 gas at STP b) 15 L of N_2 gas at STP c) 0 5 g of H_2 gas
    d) 10 g of O_2 gas
40. Chlorine gas is prepared by reaction of H_2SO_4 with MnO_2 and NaCl. What volume of Cl_2 will be produced at STP if 50 g of NaCl is taken in the reaction?
    a) 1.915 L b) 22.4 L c) 11.2 L d) 9.57 L

41. The weight of AgCl precipitated when a solution containing 5.85 g of NaCl is added to a solution containing 3.4 g of $AgNO_3$ is
    a) 28 g b) 9.25 g c) 2.870 g d) 58 g
42. What is the mass of carbon dioxide which contains the same number of molecules as are contained in 40 g of oxygen?
    a) 40 g b) 55 g c) 32 g d) 44 g
43. What will be the molality of chloroform in the water sample which contains 15 ppm chloroform by mass?
    a) 1.25×10^{-4} m b) 2.5×10^{-4} m c) 1.5×10^{-3} m d) 1.25×10^{-5} m
44. Match the prefixes present in column I with their multiples in column II and mark the appropriate choice.

Column I(Prefixes)		**Column II(Multiples)**	
(A)	plco	(i)	10^{9}
(B)	femto	(ii)	10^{-3}
(C)	milli	(iii)	10^{-12}
(D)	glga	(iv)	10^{-15}

    a) (A) $\rightarrow$ (i), (B) $\rightarrow$ (ii), (C) $\rightarrow$ (iii), (D) $\rightarrow$ (iv)
    b) (A) $\rightarrow$ (ii), (B) $\rightarrow$ (i), (C) $\rightarrow$ (iv), (D) $\rightarrow$ (iii)
    c) (A) $\rightarrow$ (iv), (B) $\rightarrow$ (iii), (C) $\rightarrow$ (i), (D) $\rightarrow$ (ii)
    d) (A) $\rightarrow$ (iii), (B) $\rightarrow$ (iv), (C) $\rightarrow$ (ii), (D) $\rightarrow$ (i)
45. At NTP, 1 L of O_2 reacts with 3 L of carbon monoxide. What will be the volume of CO and CO_2 after the reaction?
    a) 1 L CO_2, 1 L CO b) 2 L CO_2, 2 L CO c) 1 LCO_2,2 LCO d) 2 L CO_2, 1 L CO
46. Concentrated aqueous sulphuric acid is 98% H_2SO_4 by mass and has a density of 1.80 g mL^{-1}. Volume of acid required to make one litre of 0.1 M H_2SO_4 solution is
    a) 16.65 mL b) 22.20 mL c) 5.55 mL d) ll.l0 mL
47. The number of moles of hydrogen molecules required to produce 20 moles of ammonia through Haber's process is:
    a) 20 b) 30 c) 40 d) 10
48. Few quantities with their units are listed below. Mark the units which are not correctly matched.
    (i) Density: kg m^{-3}
    (ii) Velocity of light: m S^{-1}

(iii) Planck's constant :J^{-1} S^{-1}

(iv) Acceleration: m S^{-2}

(v) Force: kg m

a) (ii) and (iv) b) (i) and (iii) c) (iii) and (v) d) (iv) and (v)

49. **Assertion:** One mole of a substance always contain the same number of entities, no matter what the substance may be.

Reason: One mole is the amount of a substance that contains as many particles or entities as there are atoms in exactly 12 g of the ^{12}C isotope.

One mole of a substance always contain the same number of entities, no matter what the substance may be.

a)

Both Assertion and Reason are correct and Reason is the correct explanation of Assertion

b)

Both Assertion and Reason are correct but Reason is not the correct explanationof Assertion

c) Assertion is correct but Reason is incorrect

d) Both Assertion and Reason are incorrect.

50. A solution is made by dissolving 49 g of H_2S0_4 in 250 mL of water. The molarity of the solution prepared is

a) 2 M b) 1 M c) 4 M d) 5 M

51. 0.48 g of a sample of a compound containing boron and oxygen contains 0.192 g of boron and 0.288 g of oxygen. What will be the percentage composition of the compound?

a) 60% and 40% B and O respectively b) 40% and 60% B and O respectively

c) 30% and 70% B and O respectively d) 70% and 30% B and O respectively

52. How many grams of concentrated nitric acid solution should be used to prepare 250 mL of 2.0 M HNO_3? The concentrated acid is 70% HNO_3.

a) 45.0 g conc. HNO_3 b) 90.0 g conc. HNO_3 c) 70.0 g conc. HNO_3

d) 540 g conc. HNO_3

53. Number of atoms in 4.25 g of NH_3 is:

a) 6.023×10^{23} b) $4 \times 6.023 \times 10^{23}$ c) 1.7×10^{24} d) $4.5 \times 6.023 \times 10^{23}$

54. Number of moles of MnO^-_4 required to oxidize one mole of ferrous oxalate completely in acidic medium will be:
    a) 0.6 moles b) 0.4 moles c) 7.5 moles d) 0.2 moles
55. **Assertion:** 12 parts by mass of carbon in CO and CO_2 molecules combine with 16 and 32 parts by mass of oxygen.
    Reason: A given compound always contains exactly the same proportion of elements by weight.
    a)
    If both assertion and reason are true and reason is the correct explanation of assertion.
    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion
    c) If assertion is true but reason is false.
    d) If both assertion and reason are false.
56. Which has maximum number of molecules?
    a) 7 g N_2 b) 2 g H_2 c) 16 g NO_2 d) 16 g O_2
57. Mark the conversion factor which is not correct.
    a) 1 atm = 1.01325 x 10^5 Pa b) 1 metre = 39.37 inches c) 1 litre = 10^{-3} m^3
    d) 1 inch = 3.33 cm
58. The number of atoms in 0.1 mole of a triatomic gas is (N_A= 6.02 X 10^{23} mol^{-1})
    a) 6.026 x 10^{22} b) 1.806 x 10^{23} c) 3.6 x 10^{23} d) 1.8 x 10^{22}
59. What volume of dioxygen is required for complete combustion of 2 volumes of acetylene gas at NTP?
    a) 2 Volumes b) 5 Volumes c) 10 Volumes d) 4 Volumes
60. Assuming fully decomposed, the volume of CO_2, released at STP on heating 9.85 g of $BaCO_3$ (Atomic mass, Ba = 137)will be
    a) 2.24 l b) 4.96 l c) 1.12 l d) 0.84 l
61. Which of the following correctly represents 180 g of water?
    (i) 5 moles of water
    (ii) 10 moles of water
    (iii) 6.023 x 10^{23}molecules of water
    (iv) 6.023 x 10^{24}molecules of water

a) (i) b) (ii) c) (iii) d) (iv)

62. If the concentration of glucose ($C_6H_{12}O_6$) in blood is 0.9 g L^{-1}, what will be the molarity of glucose in blood?
    a) 5 M b) 50 M c) 0.005 M d) 0.5 M
63. Which of the following statements about Avogadro's hypothesis is correct?
    a)
    Under similar conditions of temperature and pressure, gases react with each other in simple ratio.
    b)
    Under similar conditions of temperature and pressure, equal volumes of all gases contain same number of molecules.
    c) At NTP all gases contain same number of molecules.
    d) Gases always react with gases only at the given temperature and pressure.
64. How many number of aluminium ions are present in 0.051 g of aluminium oxide?
    a) 6.023×10^{20} ions b) 3 ions c) 6.023×10^{23} ions d) 9 ions
65. Chemical reactions involve interaction of atoms and molecules. A large number of atoms/molecules (approximately 6.023×10^{23}) are present in a few grams of any chemical compound varying with their atomic/molecular masses. To handle such large numbers conveniently, the mole concept was introduced. This concept has implications in diverse areas such as analytical chemistry, biochemistry, electrochemistry and radiochemistry. The following example illustrates a typical case, involving chemical! electrochemical reaction, which requires a clear understanding of the mole concept.
    A 4.0 molar aqueous solution of NaCI is prepared and 500 mL of this solution is electrolysed. This leads to the evolution of chlorine gas at one of the electrodes (atomic mass: Na = 23, Hg = 200; lfaraday = 96500 coulombs).
    If the cathode is a Hg electrode, the maximum weight (g) of amalgam formed from this solution is
    a) 200 b) 225 c) 400 d) 446
66. **Assertion:** Matter can neither be created nor destroyed.
    Reason: This is law of definite proportions.

a)

If both assertion and reason are true and reason is the correct explanation of assertion

b)

If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

67. What is $[OH^-]$ in the final solution prepared by mixing 20.0 mL of 0.050 M HCl with 30.0 mL of 0. 10 M $Ba(OH_2)$?
    a) 0.40M b) 0.0050M c) 0.12M d) 0.10M
68. Chemical reactions involve interaction of atoms and molecules. A large number of atoms/molecules (approximately 6.023×10^{23}) are present in a few grams of any chemical compound varying with their atomic/molecular masses. To handle such large numbers conveniently, the mole concept was introduced. This concept has implications in diverse areas such as analytical chemistry, biochemistry, electrochemistry and radiochemistry. The following example illustrates a typical case, involving chemical! electrochemical reaction, which requires a clear understanding of the mole concept.
    A 4.0 molar aqueous solution of NaCI is prepared and 500 mL of this solution is electrolysed. This leads to the evolution of chlorine gas at one of the electrodes (atomic mass: Na = 23, Hg = 200; lfaraday = 96500 coulombs).
    The total charge (coulombs) required for complete electrolysis is
    a) 24125 b) 48250 c) 96500 d) 193000
69. **Assertion:** Solids have definite volume and shape.
    Reason: In solids, the constituent particles are very close to each other and there is not much freedom of movement

    a)

    If both assertion and reason are true and reason is the correct explanation of assertion.

    b)

    If both assertion and reason are true but reason is not the correct explanation of assertion

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

70. Total number of atoms present in 34 g of NH_3 is
    a) 4×10^{23} b) 4.8×10^{21} c) 2×10^{23} d) 48×10^{23}
71. **Assertion:** On heating, a solid usually changes to a liquid and the liquid on further heating changes to the gaseous state.
    Reason : Arrangement of constituent particles is different in solid, liquid and gaseous state.
    a)
    If both assertion and reason are true and reason is the correct explanation of assertion.

    b)
    If both assertion and reason are true but reason is not the correct explanation of assertion.

    c) If assertion is true but reason is false.

    d) If both assertion and reason are false.
72. Liquid benzene (C_6H_6) burns in oxygen according to the equation, $2C_6H_6(l) + 15O_2(g) \longrightarrow 12CO_2(g) + 6H_2O(g)$ How many litres of O_2 at STP are needed to complete the combustion of 39 g of liquid benzene? (Mol. weight of $O_2 = 32$, $C_6H_6 = 78$)
    a) 74 L b) 11.2 L c) 22.4 L d) 84 L
73. The number of water molecules is maximum in:
    a) 1.8 gram of water b) 18 gram of water c) 18 moles of water
    d) 18 molecules of water
74. When 22.4 L of H_2 (g) is mixed with 11.2 L of Cl_2 (g), each at STP, the moles of HCl (g) formed is equal to:
    a) 1 mole of HCl (g) b) 2 moles of HCl (g) c) 0.5 mole of HCl (g)
    d) 1.5 moles of HCl (g)
75. The final molarity of a solution made by mixing 50 mL of 0.5 M HCl, 150 mL of 0.25 M HCl and water to make the volume 250 mL is
    a) 0.5 M b) 1 M c) 0.75 M d) 0.25 M

76. **Assertion :** Molecular formula shows the exact number of different types of atoms present in a molecule of a compound.
Reason: Molecular formula can be obtained directly from empirical formula which represents the simplest whole number ratio of various atoms present in a compound.
a)
Both Assertion and Reason are correct and Reason is the correct explantion for Assertion
b)
Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion
c) Assertion is correct but Reason is incorrect
d) Both Assertion and Reason are incorrect
77. In the reaction $4\mathrm{NH_3}(g) + 5\mathrm{O_2}(g) - 4\mathrm{NO}(g) + 6\mathrm{H_2O}(l)$ When I mole of ammonia and I mole of O_2 are made to react to completion, then
a) 1.0 mole of H_2O is produced b) 1.0 mole of NO will be produced
c) all the oxygen will be consumed d) all the ammonia will be consumed
78. What will be the mass of 100 atoms of hydrogen?
a) 100 g b) 1.66 x 10^{-22} g c) 6.023 x 10^{23}g d) 100 x 6.023 x 10^{23} g
79. The mass of carbon anode consumed (giving only carbon dioxide) in the production of 1279 kg of aluminium metal from bauxite by the hall process is (Atomic mass: A1= 27)
a) 270 kg b) 540 kg c) 90 kg d) 180 kg
80. Oxygen occurs in nature as a mixture of isotopes ^{16}O, ^{17}O and ^{18}O having atomic masses of 15.995 u, 16.999 u and 17.999 u and relative abundance of 99.763%, 0.037% and 0.200% respectively. What is the average atomic mass of oxygen?
a) 15.999 u b) 16.999 u c) 17.999 u d) 18.999 u
81. Suppose the elements X and Y combine to form two compounds XY_2 and X_3Y_2. When 0.1 mole of XY_2 weighs 10 g and 0.05 mole of X_3Y_2 weighs 9 g, the atomic weights of X and Y are:
a) 40, 30 b) 60, 40 c) 20, 30 d) 30, 20
82. The mass of one mole of a substance in grams is called its
a) molecular mass b) molar mass c) Avogadro's mass d) formula mass

83. The number of atoms in 0.1 mol of a triatomic gas is:
(N_A = 6.02 x 10^{23} mol^{-l})
a) 6.026 x 10^{22} b) 1 .806 x 10^{23} c) 3.600 x 10^{23} d) 1.800 x 10^{22}

84. 10 g of hydrogen and 64 g of oxygen were filled in a steel vessel and exploded. Amount of water produced in this reaction will be :
a) 2 moles b) 3 moles c) 4 moles d) 1 moles

85. The percentage weight of Zn in white vitriol ($ZnSO_4.7H_2O$) is approximately equal to (at. mass of Zn = 65, S = 32, O = 16 and H = 1) :
a) 33.65% b) 32.65% c) 23.65% d) 22.65%

86. One mole of any substance contains 6.022 x 10^{23} atoms/molecules. Number of molecules of H_2SO_4 present in 100 mL of 0.02 M H_2SO_4 solution is _____ molecules.
a) 12.044 x 10^{20} b) 6.022 x 10^{23} c) 1 x 10^{23} d) 12.044 x 10^{23}

87. Volume occupied by one molecule of water (density = 1 g cm-3) is :
a) 9.0 x $10^{-23}cm^3$ b) 6.023 x $10^{-23}cm^3$ c) 3.0 x $10^{-23}cm^3$ d) 5.5 x $10^{-23}cm^3$

88. If Avogadro number N_A, is changed from 6.022 x 10^{23} mol^{-1} to 6.022 x 10^{20} mol^{-1} this would change:
a) the definition of mass in units of grams.
b) the mass of one mole of carbon.
c) the ratio of chemical species to each other in balanced equation.
d) the ratio of elements to each other in a compound.

89. **Assertion :** One atomic mass unit is defined as one twelfth of the mass of one carbon -12 atom.
Reason : Carbon-12 isotope is the most abundant isotope of carbon and has been chosen as standard.
One atomic mass unit is defined as one twelfth of the mass of one carbon - 12 atom.
a)
Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
b)
Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion

c) Assertion is correct but Reason is incorrect
d) Both Assertion and Reason are incorrect

90. How many number of molecules and atoms respectively are present in 2.8 litres of a diatomic gas at STP?
a) $15 \times 10^{22}, 7.5 \times 10^{23}$ b) $6.023 \times 10^{23}, 7.5 \times 10^{23}$ c) $6.023 \times 10^{23}, 15 \times 10^{22}$
d) $7.5 \times 10^{22}, 15 \times 10^{22}$

91. In a reaction container, 100 g of hydrogen and 100 g of Cl_2 are mixed for the formation of HCI gas. What is the limiting reagent and how much HCI is formed in the reaction?
a) H_2 is limiting reagent and 36.5 g of HCI are formed.
b) Cl_2 is limiting reagent and 104.28 g of HCI are formed.
c) H_2 is limiting reagent and 142 g of HCl are formed.
d) Cl_2 is limiting reagent and 73 g of HCI are formed.

92. 20.0 g of a magnesium carbonate sample decomposes on heating to give carbon dioxide and 8.0 g magnesium oxide. What will be the percentage purity of magnesium carbonate in the sample? (At. Wt. Mg = 24)
a) 75 b) 96 c) 60 d) 84

93. What volume of oxygen gas (O_2) measured at 0^oC and 1 atm, is needed to burn completely lL of propane gas., (C_3H_8) measured under the same conditions
a) 7 L b) 6 L c) 5 L d) 10 L

94. At STP, the density of CCL_4 vapour in g/Lwill be nearest
a) 6.87 b) 3.42 c) 10.26 d) 4.57

95. 1.4 moles of phosphorus trichloride are present in a sample. How many atoms are there in the sample?
a) 5.6 b) 34 c) 2.4×10^{23} d) 3.372×10^{24}

96. The density of a gas is 1.78 g L^{-1} at STP. The weight of one mole of a gas is
a) 39.9 g b) 22.4 g c) 3.56 g d) 29 g

97. How many moles of lead (II) chloride will be formed from a reaction between 6.5 g of PbO and 3.2 g of HCI? (Atomic wt. of Pb = 207)
P bO + 2HCl $\longrightarrow$ $PbCl_2 + H_2O$
a) 0.044 b) 0.333 c) 0.011 d) 0.029

98. Which of the following options is not correct?

a) 2.300 + 0.02017 + 0.02015 = 2.340 b) 126, 000 has 3 Significant figures

c) 15.15 μs = 1.515 x 10^{-5} s d) 0.0048 = 48 x 10^{-3}

99. If 500 mL of a 5 M solution is diluted to 1500 ml, what will be the molarity of the solution obtained?

a) 1.5 M b) 1.66 M c) 0.017 M d) 1.59 M

100. The total number of valence electrons in 4.2 g of $N3^-$ion is (N_A is the Avogadro's number)

a) 2.1N_A b) 4.2 N_A c) 1.6 N_A d) 3.2 N_A

101. The density of 3 molal solution of NaOH is 1.110 g mL^{-1} The molarity of the solution is

a) 2.69 M b) 2.97 M c) 4.57 M d) 6.70 M

102. In an experiment, it showed that 10 mL of 0.05 M solution of chloride required 10 mL of 0.1 M solution of $AgNO_3$, which of the following will be the formula of the chloride (X stands for the symbol of the element other than chlorine):

a) X_2Cl b) X_2Cl_2 c) XCl_2 d) XCl_4

103. In which case is the number of molecules of water maximum?

a) 18 mL of water b) 0.18 g of water

c) 0.00224 L of water vapours at 1 atm and 273 K d) 10^{-3} mol of water

104. Packing of Na^+ and Cl^- ions in sodium chloride is depicted by the given figure. Choose the correct option regarding formula mass of sodium chloride.

a) In the solid state, sodium chloride does not exist as a single entity.

b) Formula mass of NaCl is 68.0 u

c) Formula mass of NaCl is the sum of atomic masses of Na and Cl.

d) Both (a) and (c)

105. 4.88 g of $KClO_3$ when heated produced 1.92 g of O_2 and 2.96 g of KCl. Which of the following statements regarding the experiment is correct?

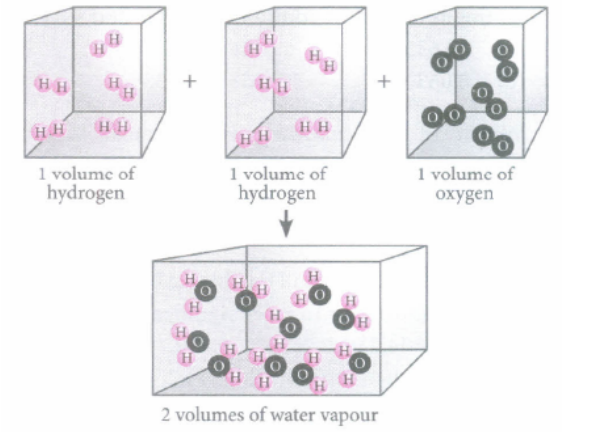
a) The result illustrates the law of conservation of mass.

b) The result illustrates the law of multiple proportions.

c) The result illustrates the law of constant proportion.

d) None of the above laws is followed.

106. Which of the following law of chemical combination is satisfied by the figure?



a) Law of multiple proportion b) Dalton's law c) Avogadro law

d) Law of conservation of mass

107. 1 cc N_2O at NTP contains

a) $\frac{1.8}{224} \times 10^{22}$ atoms b) $\frac{6.02}{22400} \times 10^{23}$ molecules c) $\frac{1.32}{224} \times 10^{23}$ electrons

d) all of the above

108. The reactant which is entirely consumed in reaction is known as limiting reagent. In the reaction 2A + 4B → 3C + 4D, when 5 moles of A react with 6 moles of B, then (a) which is the limiting reagent?

(b) calculate the amount of C formed?

a) C, 4.5 mol b) B, 4.5 mol c) B, 3.5 mol d) C,4.0 mol

109. How many moles of oxygen gas can be produced during electrolytic decomposition of 180 g of water?

a) 2.5 moles b) 5 moles c) 10 moles d) 7 moles

110. In a mixture of gases, the volume content of a gas is 0.06% at STP. Calculate the number of molecules of the gas in 1 L of the mixture.

a) 1.613×10^{23} b) 6.023×10^{23} c) 1.61×10^{27} d) 1.61×10^{19}

111. Hydrogen gas is prepared in the laboratory by reacting dilute HCl with granulated zinc. Following reaction takes place:

$Zn + 2HCl \rightarrow ZnCl_2 + H_2$

What would be the volume of hydrogen gas liberated at STP when 32.65 g of zinc reacts with HCl?

a) 10.03 L b) 11.35 L c) 11.57 L d) 9.53 L

12. **Assertion:** The reactant which is present in larger amount limits the amount of product formed is called limiting reagent.
Reason : Amount of product formed does not depend upon the amount of reactants taken.
a)
Both Assertion and Reason are correct and Reason is the correct explanation for Assertion
b)
Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion
c) Assertion is correct but Reason is incorrect
d) Both Assertion and Reason are incorrect

13. 18.72 g of a substance ' X ' occupies 1.81 cm^3 What will be its density measured in correct significant figures?
a) 10.3 g cm^{-3} b) 10.34 g cm^{-3} c) 10.4 g cm^{-3} d) 10.3425 g cm^{-3}

14. How much mass of sodium acetate is required to make 250 mL of 0.575 molar aqueous solution?
a) 11.79 g b) 15.38 g c) 10.81 g d) 25.35g

15. What is the mass per cent of oxygen in ethanol?
a) 52.14% b) 13.13% c) 16% d) 34.73%

16. **Assertion:** Molarity of a solution does not depend upon temperature whereas molality depends.
Reason : Molarity and molality both depend only on the number of moles of solute particles.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion
c) If assertion is true but reason is false.
d) If both assertion and reason are false.

17. Which of the following rules regarding the significant figures and calculations involving them is not correct?

a)

The result of an addition or subtraction is reported to the same number of decimal places as present in number with least decimal places

b)

Result of multiplication or division should have same number of Significant figures as present in most precise figure.

c)

The result of multiplication or division should be rounded off to same number of significant figures as present in least precise figure.

d) The non-significant figures in the measurements are rounded off.

18. In an experiment, 2.4 g ofiron oxide on reduction with hydrogen gave 1.68 g of iron. In another experiment, 2.7 g of iron oxide gave 1.89 g of iron on reduction. Which law is illustrated from the above data?

    a) Law of constant proportions b) Law of multiple proportions

    c) Law of reciprocal proportions d) Law of conservation of mass

19. A metal oxide has the formula Z_2O_3 . It can be reduced by hydrogen to give free metal and water .0.1596 g of the metal oxide requires 6 mg of hydrogen for complete reduction. The atomic weight of the metal is

    a) 27.9 b) 159.6 c) 79.8 d) 55.8

20. What mass of sodium chloride would be decomposed by 9.8 g of sulphuric acid if 12 g of sodium bisulphate and 2.75 g of hydrogen chloride were produced in a reaction?

    a) 14.75 g b) 3.8 g c) 4.95 g d) 2.2 g

21. Which has the maximum number of molecules among the following?

    a) 44 g CO_2 b) 48 g O_3 c) 8gH_2 d) 64gSO_2

22. How many oxygen atoms will be present in 88 g of CO_2?

    a) 24.08×10^{23} b) 6.023×10^{23} c) 44×10^{23} d) 22×10^{24}

23. Liquid benzene (C_6H_6) burns in oxygen according to the equation, $2\mathrm{C_6H_6}(l) + 15\mathrm{O_2}(\mathrm{g}) \rightarrow 12\mathrm{CO_2}(g) + 6\mathrm{H_2O}(g)$ How many litres of O_2 at STP are needed to complete the combustion of 39 g of liquid benzene? (Mol. weight of O_2, = 32,C_6H_6 = 78)

    a) 74 L b) 11.2 L c) 22.4 L d) 84 L

24. Which mode of concentration does not change with temperature?

a) Molarity b) Normality c) Molality d) All of these

25. In the final answer of the expression $\frac{(29.2-20.2)\quad(1.79\times10^5)}{1.37}$ The number of significant figures is :
a) 1 b) 2 c) 3 d) 4

26. What will be the standard molar volume of He, if its density is 0.1784 g/L at STP?
a) 11.2 L b) 22.4 L c) 5.6 L d) 2.8 L

27. **Assertion:** Elements and compounds are the examples of pure substances.
Reason: The properties of a compound are different from those of its constituent elements.
a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
I
f both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.

28. An element, X has the following isotopic composition ^{200}X : 90%, ^{199}X: 8.0%, ^{202}X: 2.0%. The weighted average atomic mass of the naturally occurring element X is closest to :
a) 201 amu b) 202 amu c) 199 amu d) 200 amu

29. Carbon occurs in nature as a mixture of ^{12}C and ^{13}C. The average atomic mass of carbon is 12.011.what is the % abundance of ^{12}C in nature?
a) 88.9% b) 98.9% c) 89.9% d) 79.9%

30. The number of moles of $KMnO_4$ reduced by 1 mol of KI in alkaline medium is:
a) 1/5 b) 2 c) 3/2 d) 4

31. Ratio of C_p and C_v - of a gas 'X' C is 1: 4- The number of atoms of the gas 'X' present in 11.2 L of it at NTP will be
a) 6.02×10^{23} b) 1.2×10^{23} c) 3.01×10^{23} d) 2.01×10^{23}

32. **Assertion**: Scientific notation for the number 100 is expressed as 1×10^2.
Reason: The number 1×10^2 has two significantfigures

a)
If both assertion and reason are true and reason is the correct explanation of assertion.
b)
If both assertion and reason are true but reason is not the correct explanation of assertion.
c) If assertion is true but reason is false.
d) If both assertion and reason are false.

133. 45.4 L of dinitrogen reacted with 22.7 L of dioxygen and 45.4 L of nitrous oxide was formed. The reaction is given below:
$2N_2(g) + O_2(g) \rightarrow 2N_2O(g)$
Which law is being obeyed in this experiment?
a) Gay Lussac's law b) Law of definite proportion
c) Law of multiple proportion d) Avogadro's law

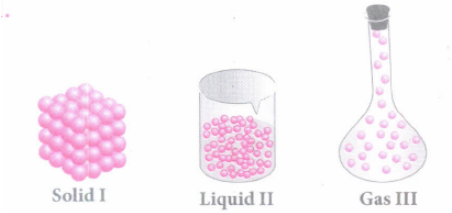
134. Choose the molecular formula of an oxide of iron in which the mass per cent of iron and oxygen are 69.9 and 30.1 respectively and its molecular mass is 160.
a) FeO b) Fe_3O_4 c) Fe_2O_3 d) FeO_2

135. Which of the following is dependent on temperature?
a) Molality b) Molarity c) Mole fraction d) Weight percentage

136. What volume of water is to be added to 100 cm^3 of 0.5 M NaOH solution to make it 0.1 M solution?
a) 200 cm^3 b) 400 cm^3 c) 500 cm^3 d) 100 cm^3

137. What is the mass of precipitate formed when 50 mL of 16.9% (w/v) solution of $AgNO_3$ is mixed with 50 mL of 5.8% NaCl solution? (Ag = 107.8, N = 14, O= 16, Na = 23, Cl = 35.5) :
a) 3.5 g b) 7.16 g c) 14 g d) 28 g

138. An impure sample of silver (1.5 g) is heated with S to form 0.124 g of Ag_2S. What was the per cent yield of Ag_2S?
a) 21.6% b) 7.2% c) 1.7% d) 24.8%

39. 

Choose the correct statement about I, II and III.

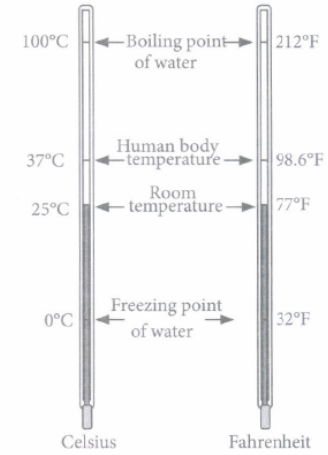
a) I and II have definite volume but III does not have this property.

b)

I, II and III are interconvertible by changing the conditions of temperature and pressure.

c) In the particles of I, freedom of movement is large. d) Both (a) and (b).

40. Consider the following figure,



The correct relationship between fahrenheit and celsius scale is

a) $^{\circ}F = {}^{\circ}C + 273.15$ b) $^{\circ}F = \frac{2}{5}{}^{\circ}C + 16$ c) $^{\circ}F = \frac{9}{5}{}^{\circ}C + 32$ d) $^{\circ}F = \frac{1}{3}{}^{\circ}C + 32$

41. 6.02 X 10^{20} molecules of urea are present in 100 mL of its solution. The concentration of solution is :

a) 0.02 M b) 0.01 M. c) 0.001 M d) 0.1 M

42. How much copper is present in 50 g of $CuSo_4$?

a) 19.90 g b) 39.81 g c) 63.5 g d) 31.71 g

43. Mole fraction of the solute in a 1.00 molal aqueous solution is :

a) 0.0177 b) 0.0344 c) 1.7700 d) 0.1770

44. What is the weight of oxygen required for the complete combustion of 2.8 kg of ethylene?

a) 2.8 kg b) 6.4 kg c) 9.6 kg d) 96 kg

45. A compound, on analysis, gave the following percentage composition:
Na = 14.31%, S = 9.97%, H = 6.22%, O= 69.5%
What would be the molecular formula of the compound assuming that all the hydrogen in the compound is reset in combination with oxygen as water of crystallisation. Molecular weight of the compound is 322.
a) Na_2SO_4 b) $Na_2SO_4 \cdot 10H_{2O}$ c) Na_2SH_{l0O12} d) $Na_2SO_4 \cdot 7H_2O$

46. If 40 g of $CaCO_3$ is treated with 40 g of HCl, which of the reactants will act as limiting reagent?
a) $CaCO_3$ b) HCl c) Both (a) and (b) d) None of these

47. Few figures are expressed in scientific notation.Mark the incorrect one.
a) 234000 = 2.34 x 10^5 b) 8008 = 8 x 10^3 c) 0.0048 = 4.8 x 10^{-3}
d) 500.0 = 5.00 X 10^2

48. What will be the molarity of the solution in which 0.365 g of HCl gas is dissolved in 100 mL of solution?
a) 2 M b) 0.2 M c) 1 M d) 0.1 M

49. Which will make basic buffer?
a) 100 mL of 0.1 MCH_3COOH+ 100ml of 0.l MNaOH
b) 100 mL of 0.1 M HCl + 200 mL of 0.1 MNH_4OH
c) 100 mL of 0.1 MHCl + 100ml of 0.l MNaOH
d) 50 mL of 0. 1 MNaOH + 25 mL of 0. I MCH_3COOH

50. How many seconds are there in 3 days?
a) 259200 s b) 172800 s c) 24800 s d) 72000 s

51. In the final answer of the expression $\frac{(29.2-20.2)\left(1.79\times10^5\right)}{1.37}$ the number of significant figures is
a) 1 b) 2 c) 3 d) 4

52. In Haber process 30 litres of dihydrogen and 30 litres of dinitrogen were taken for reaction which yield only 50% of the expected product. What will be composition of gaseous mixture under the aforesaid condition in the end?
a) 20 litres ammonia, 25 litres nitrogen, 15 litres hydrogen
b) 20 litres ammonia, 20 litres nitrogen, 20 litres hydrogen
c) 10 litres ammonia, 25 litres nitrogen, 15 litres hydrogen
d) 20 litres ammonia, 10 liters nitrogen, 30 litres hydrogen

53. A gas has molecular formula (CH)n If vapour density of the gas is 39, what should be the formula of the compound?

a) C_2H_3 b) C_4H_4 c) C_2H_2 d) C_2H_6

54. **Assertion:** Components of a homogeneous mixture cannot be separated by using physical methods.

Reason : Composition of homogeneous mixture is uniform throughout as the components react to form a single compound.

a)

If both assertion and reason are true and reason is the correct explanation of assertion.

b)

If both assertion and reason are true but reason is not the correct explanation of assertion.

c) If assertion is true but reason is false.

d) If both assertion and reason are false.

55. Which of the following formulae is not correctly depicted?

a) Molar mass = $\frac{Mass\ of\ substance}{moles\ of\ substance}$

b) Mass of one molecule of a substance = $\frac{gram\ molecular\ mass\ of\ the\ substance}{Avogadr'o\ number}$

c) Number of molecules = $\frac{Mass\ of\ the\ substance}{Molar\ mass}$ x Agvogasro's no

d) Number of moles x molar mass = number of molecules

56. Match the column I with column II and mark the appropriate choice

	Column - I		**Column - II**
(A)	Mass of H_2 produced when 0.5 mole of zinc reacts with excessof HCl	(i)	3.01 x 10^{23} molecules
(B)	Mass of all atoms of a compound with formula $C70H_{22}$	(ii)	6.023 x 10^{23} molecules
(C)	Number of molecules in 35.5 g of Cl_2	(iii)	1.43 x 10^{-21}g
(D)	Number of molecules in 64 g of SO_2	(iv)	1g

a) (A) $\rightarrow$ (ii), (B) $\rightarrow$ (i), (C) $\rightarrow$ (iv), (D) $\rightarrow$ (iii)

b) (A) $\rightarrow$ (i), (B) $\rightarrow$ (ii), (C) $\rightarrow$ (iii), (D) $\rightarrow$ (iv)

c) (A) $\rightarrow$ (iv), (B) $\rightarrow$ (iii), (C) $\rightarrow$ (i), (D) $\rightarrow$ (ii)

d) (A) $\rightarrow$ (iv), (B) $\rightarrow$ (iii), (C) $\rightarrow$ (ii), (D) $\rightarrow$ (i)

57. Iron can be obtained by reduction of iron oxide (Fe_3O_4)With CO according to the reaction;

$Fe_3O_4 + 4CO \rightarrow 3Fe + 4CO_2$

How many kg of Fe_3O_4 should be heated with CO to get 3 kg of iron?

a) 8.12 kg b) 4.14 kg c) 6.94 kg d) 16.8 kg

58. Specific volume of cylindrical virus particle is 6.02×10^{-2} cc/gm, whose radius and length are 7 Å and 10 Å respectively. If $N_A = 6.02 \times 10^{23}$, find molecular weight of virus:

a) 1.54 kg/mol b) 1.54×10^4 kg/mol c) 3.08×10^4 kg/mol

d) 3.08×10^3 kg/mol

59. What will be the molarity of a solution, which contains 5.85 g of NaCl(s) per 500 mL?

a) 4 $molL^{-1}$ b) 20 $molL^{-1}$ c) 0.2 $molL^{-1}$ d) 2 $molL^{-1}$

60. Which of the following statements best explains the law of conservation of mass?

a) 100 g of water is heated to give steam

b)

A sample of N_2 gas is heated at constant pressure without any change in mass.

c) 36 g of carbon combines with 32 g of oxygen to form 68 g of CO_2

d) 10 g of carbon is heated in vacuum without any change in mass

61. **Assertion:** The mass of a substance is constant whereas its weight may vary from one place to another.

Reason : Mass of a substance is the amount of matter present in it while weight is the force exerted by gravity on an object.

a)

Both Assertion and Reason are correct and Reason is the correct explanation for Assertion

b)

Both Assertion and Reason are correct but Reason is not the correct explanation for Assertion

c) Assertion is correct but Reason is incorrect

d) Both Assertion and Reason are incorrect

162. Chemical reactions involve interaction of atoms and molecules. A large number of atoms/molecules (approximately 6.023×10^{23}) are present in a few grams of any chemical compound varying with their atomic/molecular masses. To handle such large numbers conveniently, the mole concept was introduced. This concept has implications in diverse areas such as analytical chemistry, biochemistry, electrochemistry and radiochemistry. The following example illustrates a typical case, involving chemical! electrochemical reaction, which requires a clear understanding of the mole concept.
A 4.0 molar aqueous solution of NaCl is prepared and 500 mL of this solution is electrolysed. This leads to the evolution of chlorine gas at one of the electrodes (atomic mass: Na = 23, Hg = 200; faraday = 96500 coulombs).
The total number of moles of chlorine gas evolved is
a) 0.5 b) 1.0 c) 2.0 d) 3.0

163. The reference standard used for defining atomic mass is
a) H - 1 b) C - 12 c) C - 13 d) C - 14

164. Match the mass of elements given in column I with the no. of moles given in column II and mark the appropriate choice.

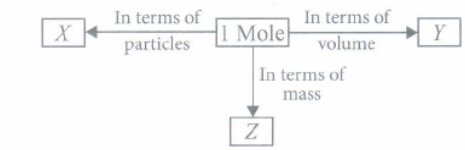
	Column I		**Column II**
A.	28 g of He	(i)	2 moles
B.	46 g of Na	(ii)	7 moles
C.	60 g of Ca	(iii)	1 mole
D.	27 g of Al	(iv)	1.5 moles

a) (A) $\rightarrow$ (iv), (B) $\rightarrow$ (iii), (C) $\rightarrow$ (ii), (D) $\rightarrow$ (i)
b) (A) $\longrightarrow$ (i), (B) $\longrightarrow$ (iii), (C) $\longrightarrow$ (ii), (D) $\longrightarrow$ (iv)
c) (A) $\longrightarrow$ (iii), (B) $\longrightarrow$ (ii), (C) $\longrightarrow$ (i), (D) $\longrightarrow$ (iv)
d) (A) $\longrightarrow$ (ii), (B) $\longrightarrow$ (i), (C) $\longrightarrow$ (iv), (D) $\longrightarrow$ (iii)

165. What will be the molality of the solution made by dissolving 10 g of NaOH in 100 g of water?
a) 2.5 m b) 5 m c) 10 m d) 1.25 m

166. What will be the answer in appropriate significant figures as a result of addition of 3.0223 and 5.041?
a) 80.633 b) 8.0633 c) 8.063 d) 806.33

167. Fill in the blanks by choosing the correct options.



a)

X	Y	Z
6.023 x 10^{23} molecules	22.4 L at any pressure	Gram Molecular mass

b)

X	Y	Z
6.023 x 10^{23} atoms/molecules	22.4 L at NTP	Gram atomic mass

c)

X	Y	Z
6.023 x 10^{23} atoms	22.4 L at any temperature	1 gram

d)

X	Y	Z
6.023 x 10^{23} particles	11.2 L at NTP	Molar volume

168. In Haber's process 30 L of dihydrogen and 30 L of dinitrogen were taken for reaction which yielded only 50% of the expected product. What will be the composition of gaseous mixture under the aforesaid condition in the end?

a) 20L ammonia, 10L nitrogen, 30L hydrogen

b) 20 L ammonia, 25 L nitrogen, 15L hydrogen

c) 20 L ammonia, 20 L nitrogen, 20 L hydrogen

d) 10L ammonia, 25 L nitrogen, 15L hydrogen

169. Which set of figures will be obtained after rounding up the following up to three significant figures?

34.216,0.04597, 10.4107

a) 34.3,0.0461,10.4 b) 34.2, 0.0460, 10.4 c) 34.20,0.460,10.40

d) 34.21,4.597, 1.04

170. Which of the following statements is correct about the reaction given below? $4Fe(s) + 3O_2(g) \rightarrow 2Fe_2O_3(g)$

a)

The total mass of reactants = Total mass of the products. It follows the law of conservation of mass.

b)

Total mass of reactants = total mass of product; therefore, law of multiple proportions is followed.

c)

Amount of Fe_2O_3 can be increased by taking anyone of the reactants (iron or oxygen) in excess.

d)

Amount of Fe_2O_3 produced will decrease if the amount of anyone of the reactants (iron or oxygen) is taken in excess.

171. How much oxygen is required for complete combustion of 560 g of ethene?
a) 6.4 kg b) 1.92 kg c) 2.8 kg d) 9.6 kg

172. Which one of the following has maximum number of atoms :
a) 1 g of Ag (s) Atomic mass of Ag = 108
b) 1 g of O_2 (g) Atomic mass of O = 16 c) 1 g of Li (s) Atomic mass of Li = 7
d) 1 g of Mg (s) Atomic mass of Mg = 24

173. Given below are few statements. Mark the statement which is not correct.
a) Atoms are neighter created nor destroyed in a chemical reaction
b)

Law of definite proportion states that a given compound always contains exactly the same proportion of elements by weight

c) Gay Lussac's law of chemical combination is valid for all substances.

d)

A pure compound has always a fixed proportion of masses of its constituents.

174. Which of the following is the most accurate measurement?
a) 9 m b) 9.0 m c) 9.00 m d) 9.000 m

175. One atom of an element weighs 3.32×10^{-23} g. How many number of gram atoms are there in 20 kg of the element?
a) 2000 b) 20 c) 200 d) 1000

176. Molarity equation of a mixture of solutions of same substance is given by
a) $M_1 + V_1 \times M_2 + V_2 \times M_3 + V_3 + ... = M_1 + M_2 + M_3$
b) $M_1V_1 + M_2V_2 + M_3V_3 + ...= M(V_1+V_2+V_3)$
c) $\frac{M_1}{V_1} + \frac{M_2}{V_2} + \frac{M_3}{V_3} + \ldots = M\left(\frac{1}{V_1} + \frac{1}{V_2} + \frac{1}{V_3}\right)$
d) $\frac{M_1}{V_1} + \frac{M_2}{V_2} + \frac{M_3}{V_3} + \ldots = M_1\left(\frac{1}{V_1} + \frac{1}{V_2} + \frac{1}{V_3}\right)$

177. 1 g of Mg is burnt in a closed vessel containing 0.5 g of O_2.Which reactant is limiting reagent and how much of the excess reactant will be left?

a) 0_2 is a limiting reagent and Mg is in excess by 0.25 g.
b) Mg is a limiting reagent and is in excess by 0.5 g.
c) 0_2 is a limiting reagent and is in excess by 0.25 g.
d) 0_2 is a limiting reagent and Mg is in excess by 0.75 g.

78. 1.0 g of magnesium is burnt with 0.56 g of oxygen in a closed vessel. Which reactant is left in excess and how much? (At. weight of Mg = 24, O= 16)
a) Mg, 0.16 g b) O_2, 0.16 g c) Mg, 0.44 g d) O_2, 0.28 g

79. What will be the weight of CO having the same number of oxygen atoms as present in 22 g of CO_2?
a) 28 g b) 22 g c) 44 g d) 72 g

80. If the density of a solution is 3.12 g mL^{-1}, the mass of 1.5 mL solution in significant figures is_____.
a) 4.7 g b) 4680 x 10^{-3} g c) 4.680 g d) 46.80 g

81. Which of the following statements about a compound is incorrect?
a) A molecule of a compound has atoms of different elements
b)
A compound cannot be separated into its constituent elements by physical methods of separation.
c) A compound retains the physical properties of its constituent elements.
d) The ratio of atoms of different elements in a compound is fixed.

82. Mark the rule which is not correctly stated about the determination of significant figures.
a) Zeros preceding to first non-zero digit are not significant.
b) Zeros preceding to first non-zero digit are not significant.
c)
Zeros at the end or right of the number are significant if they are on the right side of decimal point.
d) All non-zero digits are significant.

83. Haemoglobin contains 0.33% of iron by weight. The molecular weight of haemoglobin is approximately 67200 g. The number of iron atoms (at. weight of Fe is 56) present in one molecule of haemoglobin are:
a) 1 b) 6 c) 4 d) 2

84. Which of the following statements illustrates the law of multiple proportions?

a)

An element forms two oxides, XO and XO_2 containing 50% and 60% oxygen respectively. The ratio of masses of oxygen which combines with 1 g of element is 2 : 3.

b)

Hydrogen sulphide contains 5.89% hydrogen, water contains 11.1% hydrogen and sulphur dioxide contains 50% oxygen

c)

3.47 g of $BaCl_2$ reacts with 2.36 g of Na_2S0_4 to give 3.88 g of $BaSO_4$ and 1.95 g of NaCl.

d)

20 mL of ammonia gives 10 volumes of N_2, and 30 volumes of H_2 at constant temperature and pressure.

185. 1 L of 0.1 M NaOH, 1 L of 0.2 M KOH, and 2 L of 0.05 M $Ba(OH)_2$ are mixed together. The final concentration of the solution is

a) 0.01 M b) 0.01 N c) 0.1 N d) 0.001 M

186. A mixture of gases contains of H_2 and O_2 gases in the ratio of 1: 4 (w/w). What is the molar ratio of the two gases in the mixture?

a) 4: 1 b) 16: 1 c) 2: 1 d) 1: 4

187. How much mass of silver nitrate will react with 5.85 g of sodium chloride to produce 14.35 g of silver chloride and 8.5 g of sodium nitrate if law of conservation of mass is followed?

a) 22.85g b) 108g c) 17.0g d) 28.70g

188. How many atoms in total are present in 1 kg of sugar?

a) 7.92×10^{25} atoms b) 7.92×10^{25} atoms c) 6.022×10^{25} g d) 1000 atoms

189. In the reaction, $4NH_3\,(g) + 5O_2\,(g) \longrightarrow 4NO\,(g) + 6H_2O\,(l)$ When 1 mole of ammonia and 1 mole of O_2 are made to react to completion, then:

a) 1.0mole of H_2O is produced b) 1.0mole of NO will be produced

c) all the oxygen will be consumed d) all the ammonia will be consumed

190. Atomic masses of elements are usually fractional because:

a) they are mixtures of isotopes b) they contain impurities of other atoms

c) they are mixtures of isobars

d) atomic masses cannot be weighed accurately

91. A metal oxide has the formula Z_2O_3. It can be reduced by hydrogen to give free metal and water. 0.1596 g of the metal oxide requires 6 mg of hydrogen for complete reduction. The atomic weight of the metal is :
a) 27.9 b) 159.6 c) 79.8 d) 55.8

92. Two elements 'P' and 'Q' combine to form a compound. Atomic mass of 'P' is 12 and 'Q' is 16. Percentage of 'P' in the compound is 27.3. What will be the empirical formula of the compound?
a) P_2Q_2 b) PQ c) P_2Q d) PQ_2

93. A balanced equation for combustion of methane is given below:
$CH_{4(g)} + 2O_{2(g)}\ CO_{2(g)}+2H_2O_{(g)}$
Which of the following statements is not correct on the basis of the above chemical equation?
a)
One mole of CH_4 reacts with 2 moles of oxygen to give one mole of CO_2 and 2 moles of water.
b)
One molecule of CH_4 reacts with 2 molecules of oxygen to give one molecule of CO_2 and 2 molecules of water.
c)
22.4 L of methane reacts with 44.8 L of oxygen to give 44.8 L of CO_2 and 22.4 L of water.
d) 16 g of methane reacts with 64 g of 02 to give 44 g of CO_2 and 36 g of water.

94. Calcium carbonate decomposes on heating to give calcium oxide and carbon dioxide. How much volume of CO_2 will be obtained at STP by thermal decomposition of 50 g of $CaCO_3$?
a) 1 L b) 11.2 L c) 44 L d) 22.4 L

95. The number of significant figures for the three numbers 161 cm, 0.161 cm, 0.0161 cm are:
a) 3, 4 and 5 respectively b) 3, 4 and 4 respectively c) 3, 3 and 4 respectively
d) 3, 3, and 3 respectively

96. An organic compound on analysis gave the following results: C = 54.5%, O = 36.4%, H = 9.1%. The Empirical formula of the compound is
a) CHO_2 b) CH_2O c) C_2H_8O d) C_2H_4O

197. The relative number of atoms of elements, 'X' and 'Y' in a compound is 0.25 and 0.5. The empirical formula of compound is

a) XY b) X_2Y c) XY_2 d) X_2Y_2

198. 1.0 g of magnesium is burnt with 0.56 g O_2 in a closed vessel. Which reactant is left in excess and how much?

(At. wt. Ms = 24; 0 = 16)

a) Mg, 0.16 g b) O_2 0.16g c) Mg, 0.44 g d) O_2 0.28 g

199. Which of the following gases will have least volume if 10 g of each gas is taken at same temperature and pressure?

a) CO_2 b) N_2 c) CH_4 d) HCl

200. What is the total number of electrons present in 1.6 g of methane?

a) 6.023×10^{23} b) 16 c) 12.04×10^{23} d) 6.023×10^{24}